

way of example only, and is not limiting. Various alternations, improvements, and modifications will occur and are intended to those skilled in the art, though not expressly stated herein. These alterations, improvements, and modifications are intended to be suggested hereby, and are within the spirit and scope of the invention. Accordingly, the invention is limited only by the following claims and equivalents thereto.

What is claimed is:

1. A mask for use [on] with a layer of imaging material [which] where the mask is located on at least a portion of one surface of a substrate in a lithography process, the mask comprising a layer of a masking material which has an optical density of at least 4.0 for wavelengths at or below about 180 nm and a thickness equal to or less than about 1000 angstroms.
2. The mask as set forth in claim 1 wherein the layer of masking material comprises tungsten.
3. The mask as set forth in claim 2 wherein the tungsten has a thickness between about 400 angstroms and 1000 angstroms.
4. The mask as set forth in claim 1 wherein the layer of masking material comprises amorphous silicon.
5. The mask as set forth in claim 4 wherein the amorphous silicon has a thickness between about 400 angstroms and 1000 angstroms.
6. The mask as set forth in claim 1 further comprising an anti-reflective layer over at least a portion of the mask[.] and underneath the layer of imaging material.
7. The mask as set forth in claim 6 wherein the anti-reflective layer comprises a nitride, oxide, fluoride, or oxinitride of Ti, V, Cr, Zr, Nb, Mo, Hf, Ta, W, Cu, Ni, or Fe.
8. A lithography system comprising:
a substrate with at least one surface;
[a layer of imaging material on at least a portion of the one surface; and]
a layer of masking material which has an optical density of at least 4.0 for wavelengths at or below about 180 nm and a thickness equal to or less than about 1000 angstroms on at least a portion of the [layer of imaging material.] one surface of the substrate; and
a layer of imaging material on at least a portion of the layer of masking material.
9. The system as set forth in claim 8 wherein the layer of masking material comprises tungsten.
10. The system as set forth in claim 9 wherein the tungsten has a thickness between about 400 angstroms and 1000 angstroms.

11. The system as set forth in claim 8 wherein the layer of masking material comprises amorphous silicon.

12. The system as set forth in claim 11 wherein the amorphous silicon has a thickness between about 400 angstroms and 1000 angstroms.

13. The system as set forth in claim 8 wherein the layer of imaging material comprises photoresist.

14. The system as set forth in claim 8 further comprising an anti-reflective layer over at least a portion of the mask[.] and underneath the layer of imaging material.

15. The system as set forth in claim 14 wherein the anti-reflective layer comprises a nitride, oxide, fluoride, or oxinitride of Ti, V, Cr, Zr, Nb, Mo, Hf, Ta, W, Cu, Ni, or Fe.

16. A method for lithography comprising:

15 placing a mask over at least a portion of one surface of a substrate, wherein the mask has an optical density of at least 4.0 for wavelengths at or below about 180 nm and a thickness of less than about 1000 angstroms;

20 applying a layer of imaging material over at least a portion of the mask;

etching at least a portion of the layer of imaging material and the mask;

25 removing the remaining portion of the layer of imaging material; and

exposing the mask to radiation at wavelengths at or below about 180 nm.

17. The method as set forth in claim 16 wherein the mask comprises tungsten.

30 18. The method as set forth in claim 17 wherein the tungsten has a thickness between about 400 angstroms and 1000 angstroms.

19. The method as set forth in claim 16 wherein the mask comprises amorphous silicon.

35 20. The method as set forth in claim 19 wherein the amorphous silicon has a thickness between about 400 angstroms and 1000 angstroms.

21. The method as set forth in claim 16 further comprising applying an anti-reflective layer over at least a portion of the mask[.] wherein the layer of imaging material is applied over the anti-reflective layer.

22. The method as set forth in claim 16 wherein the anti-reflective layer comprises a nitride, oxide, fluoride, or oxinitride of Ti, V, Cr, Zr, Nb, Mo, Hf, Ta, W, Cu, Ni, or Fe.

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